# ETIOLOGY OF ABSCESS OF THE LIVER.

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# ETIOLOGY OF ABSCESS OF THE LIVER.

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With the view of determining, if possible, the most common etiological factor in this rare disease the following data have been collected from the hospital records. The work was done during my last service, as I had a case of abscess of the liver that apparently had its origin in a subacute inflammation of the appendix; a few months later a similar case was seen in private practice in consultation. In such cases as I have seen the symptoms have been obscure and the correct diagnosis has only been made late in the course of the disease, too late to give aid to the patient by any surgical procedure.

Sixteen cases are tabulated in the hospital catalogue, and to these is added one case seen in consultation. Etiologically these cases may be classified as follows:

| | |
|---|---|
| Accidental | 2 |
| Indefinite | 3 |
| Amoebic dysentery | 2 |
| Appendicitis | 10 |
| Total number of cases | 17 |

In the cases classified as accidental, one was due to an extension to the liver of an empyema, and the other was the result of a circumscribed peritonitis, secondary to the rupture of an ulcer of the stomach. In the cases classified as indefinite, no causative factor was suggested by the history or course of the case, and in one of the three a post mortem examination did not clear up the obscurity of the case. In two cases the abscess was secondary to amoebic dysentery Aside, however, from the two rare cases of amoebic abscess, the chief interest centres in the ten cases in which the process arose in an acute or subacute appendicitis.

## Cases in which appendicitis was the known or the most probable cause of the abscess.

Case 1. Man, 40 years of age, entered the hospital December 3, 1894. Twenty years previously he had had typhoid fever. Since the middle of November he had had vomiting, repeated chills, headache, pain in the back and tenderness at the epigastrium.

Heart area normal; sounds normal. The liver was enlarged to percussion, and the edge was felt one inch below the costal margin.

December 6th, there was fever. December 9th, red corpuscles, 3,800,000; leucocytes, 34,000. In the urine was a trace of albumen and a few casts; specific gravity, 1010. December 12th, the spleen was enlarged. December 10 to 12th, there were several chills at irregular intervals. December 19th, facial erysipelas. December 24th, a short systolic murmer was heard at the apex. January 22d, there was a failure in the general condition of the patient; temperature irregular.

Early in February he was transferred to the contagious service, as he developed diphtheria. At this time the diagnosis was considered to be an abscess of the liver or malignant endocarditis.

March 1st he returned to the medical wards. No enlargement of the heart was found; the systolic murmur at the apex was the same as in December. The liver dulness began at the fifth rib and extended one and three-fourths inches below the costal margin; no marked tenderness over the liver; spleen enlarged. March 8th. Had improved; temperature almost normal, while the pulse varied from 100 to 110. Red corpuscles 2,450,000 leucocytes 17,000 haemoglobin 45%. December 13th, rise of temperature but no chill. December 18th, liver extends three inches below the ribs in the mammillary line. Temperature irregular; pulse and respiration rapid. Is failing.

December 21st; gradual failure with subnormal temperature and death. Just before death for the first time abdominal pain and distress were noted. Autopsy—Heart; 290 grammes, pale and cloudy. Lungs; consolidation of the left lower lobe, also several small areas of consolidation.

Liver much enlarged, 2,800 grammes. On the surface was a thin gray membrane. In the posterior part of the right lobe was a large abscess cavity filled with thick pus, and with shreddy walls There were several similar, but smaller, abscesses. In the portal vein was a yellow thrombus. The appendix was occluded about midway by a walled-off abscess which contained a couple of drops of pus. Spleen enlarged and soft. Bacteriological examination. In the lungs an unusual capsule baccillus, not the pneumococcus, also baccilli of diphtheria. In the light of recent work by Wright, Pearce and others, it is probable that we may consider the diphtheria baccilli as the cause of the pneumonia. In the liver streptococci were found. In this case there was nothing in the history or in the physical examination to suggest that we had to look to appendicitis as the etiological factor in the septic process; yet it seems probable that the abscess of the liver was the direct result of an infection from the appendix through the medium of the portal vein.

Case 2. The following case has been published in the Boston Medical and Surgical Journal, vol. cxxxviii, p. 154.

Geo. McK., 21, single, suffering with multiple small abscesses in the liver, entered my service on July 24th. The previous history was negative, except that three years before his entrance to the hospital he was confined to bed by an acute appendicitis. At this time he was in Providence; according to the statement of the patient, there was a tumor in the region of the appendix, with severe abdominal pain. No operation was performed. The pain lasted about one week, but the patient was confined to his bed for four weeks. Since then his health had been good.

For two weeks before entrance to the hospital his appetite was poor; he had headache and at times vertigo; there was also some palpitation and distress in the region of the heart. He continued at his work as surveyor on the Boston & Albany railroad at Newton until four days before entrance to the hospital; then after a hard day's work he had severe pain in the right iliac region, which caused him to stoop forward when standing; nausea and vomiting soon followed. Two days later there was a chill followed by sweating, severe headache and delirium; the next day several chills, fever, vomiting and a good deal of pain in the right iliac region. The bowels were constipated.

Physical Examination. Expression is somewhat anxious. Mind perfectly clear. Some tenderness in the back of the neck, a symptom noted as cerebro-spinal meningitis was considered as possible in that at the time there were several cases of this disease in the hospital. No enlargement of the heart; at the base a soft musical murmur heard over the pulmonic area. Lungs, liver, spleen not abnormal. There was general abdominal tenderness, most marked in the right iliac region, where gurgling was felt; no rose-spots.

Examination of the blood showed no plasmodia malariae. Leucocytes, 7,800.

July 26th. No change in general condition. A positive Widal reaction was reported. I consider that this was probably an error due to some fault in the technique, as several subsequent examinations gave a negative result.

July 27th. Leucocytes, 8,000. Quinine was given, 20 grains, after the temperature fell a degree and a half. The quinine produced no effect upon the fever or the chills.

July 30th. Mental condition bright. No complaint was made of abdominal tenderness. The spleen was found to be somewhat enlarged. No enlargement of the heart. There was some tenderness in the right side of the abdomen, but there was not sharply localized tenderness at McBurney's point. There was no rigidity of the muscles of the right side of the abdomen, and the legs were

fully extended without causing pain. Severe chills recurred daily towards 5 o'clock, and on the 27th, 29th and 30th there was also a chill in the morning. Leucocytes, 16,800.

July 31st. Leucocytes, 23,000. Slight jaundice appeared today.

August 1st. Leucocytes, 33,000.

Up to August 5th there was a gradual loss of flesh and strength. The jaundice became more marked, and the liver extended from the fifth interspace to just below the ribs. There was slight dulness in the lower part of the right back.

After consultation with Dr. Munro it was decided to aspirate the liver, on the supposition that we had to deal with an abscess of the liver. He was etherized, and three punctures made in the region of the liver anteriorly, and one posteriorly. All were negative.

From August 5th to August 11th there were no chills, and his general condition improved a little.

August 12th. Leucocytes, 19,000.

August 13th. Again a chill. I saw him on the surgical side and suggested as a possible diagnosis malignant endocarditis, considering this diagnosis as possible in view of the negative result of the puncture made, and because a new murmur had appeared in the mitral area. The abdomen was a little tympanitic, and there was some tenderness in the region of the appendix.

August 15th. There was a violent chill at 10:30 P. M., his temperature rising to 109.5°. His death occurred three hours later. Up to the last his mental condition was bright, modified only by mild delirium at the time of the intense fever which followed the chill.

In arriving at a diagnosis we considered typhoid fever, appendicitis, malignant endocarditis, general tuberculosis, pyemia from some source not determined, and abscess of the liver.

Autopsy. Two hundred c. c. brownish fluid in the peritoneal cavity. Old adhesions between the great omentum and the right iliac wall. The appendix and caecum were bound down by old adhesions. The interior surface of the appendix was roughened and the walls thickened. Heart and lungs not abnormal. Spleen 475 gm. Liver enlarged. On the anterior surface many small white patches, especially on the left lobe; on the under surface multiple abscesses. On section many abscesses found especially in the left lobe. The portal vein was occluded by yellow adhesive thrombi and pus.

Anatomical Diagnosis. Chronic appendicitis and chronic peri-appendicitis, multiple abscesses of the liver, abscess of the mesenteric glands, acute splenic tumor.

The origin of the abscesses in the liver was obscure, as there was found aside from the acute suppurative process in the liver only the chronic appendicitis and the acute inflammation of the mesenteric glands. The duration of the disease was seven weeks, four before entrance to the hospital and three in the hospital; so it is possible that the primary trouble may have been an exacerbation of the chronic appendicitis, especially as there was found in the appendix a little inspissated pus, though there was at the time of the autopsy no evidence of a recent acute inflammation.

Case 3. Colored girl, 20 years of age, entered the hospital in January, 1892. At that time there had been for two weeks some fever and pain in the right upper quadrant of the abdomen; the liver was much enlarged but soon became smaller, and on March 1st she was discharged apparently perfectly well. The diagnosis of "acute congestion of the liver" was made at the time.

She re-entered the hospital August 18th, 1892. At that time there had been vomiting for four days with dull pain in the chest and abdomen. A chill had initiated the symptoms. In the right chest there was dullness from the third rib to one inch below the costal margin. Also dullness in the axilla and right lower back. April 21st, a needle was inserted in the ninth interspace in the back, and pus was withdrawn that evidently came from the liver. The abdomen was distended and tender all over, especially so on the right side. She was transferred to the surgical side and a free incision made over the liver; a large amount of foul pus was evacuated. Death in one and a half hours.

Autopsy. Old pleurisy. Acute fibrinous pleurisy. Chronic splenic tumor. Old appendicitis with adhesions and a pin in the appendix. Tubercular bronchial and mesenteric glands. Liver: One abscess cavity the size of an orange, and much of the liver substance riddled with small abscess cavities. In this case it is hard to trace any connection between the abscess of the liver and the old inflammatory process about the appendix, but no other pathological process was found which could have had any influence in producing the abscess.

Case 4. This is a private case, seen in consultation on May 5th, 1898. W. A. W., 38 years old, a clerk. He had lived in South Boston for 25 years, until he was married, in 1895, and moved into a suburb of Boston. His previous health had been good, though during the last year or so he had lost flesh. No abdominal symptoms, no cough and no diarrhoea. The patient said he had felt perfectly well in spite of the loss of flesh, and attributed his change to the fact that he had changed his work from night clerk to day clerk, and felt he had suffered in consequence.

On the night of April 22d he went to bed feeling perfectly

well. In the night he had general abdominal pain, vomiting, griping and diarrhoea. He went to his work the next day, but soon came home, as he felt very sick. He had then some abdominal pain and vomited several times.

April 24th; chill. April 26th; chill and frequent vomiting of small amounts, but without any pain. April 27th a chill. The chills came at irregular times, were true rigors, followed by fever and sweating. April 28th; chill. April 29th; chill; patient took to his bed. April 30th-May 1st; chill each day. Pulse on May 1st was 90 during the fever. Bowels loose, no pain, vomiting during the chills. It was considered that the disease was malaria, and quinine was given in large doses, but without any effect upon the chills. May 1st-5th; irregular temperature; the pulse was at no time above 90. I saw him on May 5th, on which day there were two chills. Physical examination. Emaciation, Jaundice. No enlargement of the heart; a systolic murmur at the aortic valve and over the apex. Lungs not abnormal. Spleen enlarged. Abdomen lax and not tender. May 6th; two chills. May 7th; two chills. Vomiting at the time of the chills. On May 7th, the liver enlarged and felt four inches below the ribs;slight tenderness over the liver. A little oedema over the liver. Leucocytes, 12,000. No Widal reaction He was seen in consultation by Dr. Munro, and we decided that abscess of the liver was the most probable diagnosis. May 17th, great loss of flesh. During the last two days pulse for the first time 120. Sordes. Occasional mild delirium. Very little pain. A rounded tumor which reached almost to the umbilicus. Over the tumor was heard a friction murmur. May 18th; Had failed very fast. The tumor had increased very much in size. It extended below the umbilicus and also across the median line. A pulsation was seen and felt in the tumor so markedly that the question was raised whether an artery had broken into the tumor. He suffered no pain and died, May 19th.

Numerous chills had recurred from May 10th to the time of death; on one day four chills.

Autopsy. Liver much enlarged and the surface was studded with yellow points, the average being about the size of the end of a slate pencil. No general peritonitis. In the right iliac fossa the intestines were tied together by adhesions which were easily torn apart, allowing a few drops of thick yellow pus to escape. Appendix bound down and friable. Spleen enlarged and soft. Liver much enlarged; on incision it was found to be practically made up of a purulent mass, only enough liver substance being left to hold together the abscesses.

It is important to note that at no time was there abdominal tenderness and no pain since the first night. Further, the patient

was not confined to his bed for a week after the initial attack. He was seen by two surgeons, both of whom went to the case expecting to find an appendicitis, but in each case failed to find physical signs which would warrant the diagnosis.

Appendicitis was not overlooked, but was not evident from the physical signs present. In this case operation would have been of no avail, as the process was rather a widespread purulent infiltration of the liver than an abscess.

In these four cases appendicitis was found in each and in three certainly may be considered as the cause of the abscess.

In the six following cases appendicitis is the most probable cause of the abscess, judging from the history and the physical examination; in none of the cases was the diagnosis confirmed by autopsy or operation. One recovered.

Case 5. A boy, 17 years old, entered April 2d. Three weeks before entrance he had pain in the stomach with vomiting; there had been a steady pain in the right side for a week; a chill almost every day for ten days. Physical examination showed pallor, moderate loss of flesh. Abdomen was distended, and the upper segment was especially prominent. Liver; dulness from the sixth rib to one and a half inches below the ribs. There was moderate tenderness to pressure in the right hypochondrium. April 11th; several chills since entrance; some tenderness at the epigastrium, especially near the xiphoid cartilage. At this date examination showed him to be fairly well developed and nourished; slight jaundice. Tongue red with a thick coat in the center. Pulse somewhat irregular. Decubitus on the back, as there was pain if he lay on his side. Liver extended from the fourth rib to two inches below the umbilicus. An aspirating needle was inserted at the point of greatest tenderness, and pus withdrawn. He was transfered to the surgical side. An incision was made down to the liver which was aspirated.

Gradual failure and death, April 22nd. Throughout the disease the temperature was very irregular and chills recurred frequenly, as seen by the chart appended.

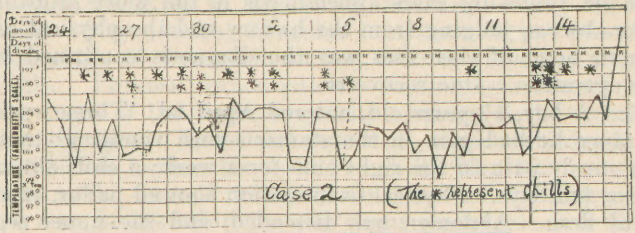
Case 6. Woman, 53, entered surgical service October 15th. She gave a history of recurrent cramp-like pains in the abdomen for several years. Seven weeks before entrance she had a sudden sharp pain at the epigastrium, which spread to the umbilicus. There was nausea and vomiting. She noticed in a few days a swelling in right iliac region, which extended upwards to the costal border.

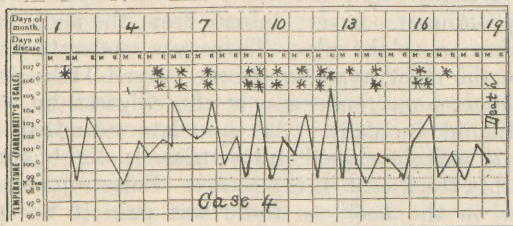
Physical examination. Heart and lungs negative. No jaundice. Liver dulness from the fifth rib to the umbilicus. The

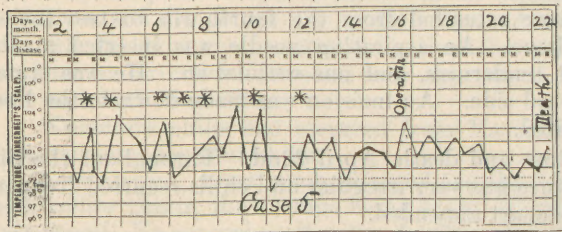
tumor was aspirated and pus was withdrawn stained with bile; bacteriological examination showed a pure culture of the streptococcus pyogenes. The tumor was incised and a pint of pus evacuated. Gradual failure, and death October 29th. No fever after the operation.

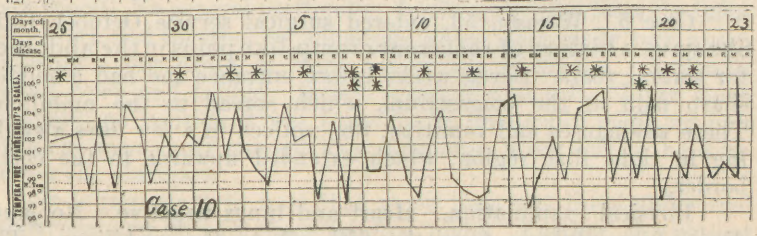
Case 7. Man, 47 years, entered the surgical service November 16th..

He had been in bed for nine weeks with "inflammation of the bowels." There had been no vomiting and no pain since the



first part of his sickness. He stated that his doctor had noticed a swelling in the right hypochondrium two weeks before he entered the hospital.

Dulness began at the fourth rib and extended to the umbilicus. November 17th; incision and two quarts of pus of a brown color removed. A counter opening was made in the back. December 4th; the tube was removed. January 16th; He was discharged; there was no sinus and he was improving fast in his general condition.

Case 8. Man, 24 years. Entered medical service July 8th.

Three months before entrance, while in Savannah, he had a "kink in his stomach." The pain was severe, kept him in bed and lasted altogether for about a month. Later he had pain under the sternum near the xiphoid cartilage.

On entrance he had pain at the epigastrium and in the right side of the abdomen. No vomiting.

Physical examination. Well developed and nourished. Slight jaundice. Heart negative. Liver dulness at fifth rib in mammillary line, at sixth rib in mid-axillary and extended three fingers' breadth below the ribs. Muscles of the abdomen tense. Spleen enlarged.

July 17th; complained of pain and tenderness in the right side of the abdomen; much sweating. July 21st; sudden death with symptoms of collapse. The course of the temperature had been irregular and the pulse rapid and irregular.

Case 9. Woman, 31. Entered medical service, July 29.

In June was suddenly seized with violent pain in the epigastrium, accompanied by vomiting. The pain and vomiting lasted for 24 hours without intermission.

Constipation and vomiting at intervals since. Marked general jaundice. Stools clay colored. Abdomen tender, especially at the epigastrium. The edge of the liver felt almost on the level of the umbilicus.

July 31st; very little pain or vomiting. August 6th; temperature has for a week fluctuated hourly, ranging in short time from normal to 105°; pulse rapid and weak. No pain. No chills. No material change until death on the 12th. The entire absence of pain in the latter part of the disease is noteworthy and is in consonance with the cases I have seen personally.

Case 10. Man, 25. Entered medical service September 25th. Was never sick before. Had used alcohol to excess.

September 14th; Had had pain in the abdomen below the umbilicus and some abdominal tenderness. September 16th; a chill. September 17th; two chills, and since then until entrance three chills each day. There had been some headache, nausea and vomiting several times.

Physical examination. Tongue dirty white coat. Heart and lungs negative. Abdomen tympanitic except in the right iliac fossa, where there was dulness and some tenderness. Area of the liver normal. Spleen enlarged edge felt. Urine negative. No plasmodia of malaria. September 21st; several chills since entrance at varying intervals. Some pain in the lower part of the abdomen.

Leucocytes, 9,000. October 8th; Chills have recurred; patient comfortable except for a little pain in the lower part of the abdomen. Leucocytes, 20,000. October 12th; has had frequent vomiting. October 21st; Murmur over the heart systolic in time. There has been a failure in his general condition. Temperature irregular, varying from normal to 105°. One or two chills almost every day. Pulse on the average about 100°. Transferred to surgical side.

October 23d; chill and temperature ran to 106°. Pain especially in the region of the umbilicus. Face pale and anxious; pulse weak and intermittent. Liver felt three inches below the ribs; the edge smooth; some tenderness over the right hypochondrium. Spleen easily felt.

A needle was inserted into the liver, but no pus was obtained.

Against the advice of the surgeon, he went home, apparently in a moribund condition.

In this, the last case of the six in which appendicitis was not proven, I feel no reasonable doubt can be raised that we had to deal with appendicitis as the primary cause of the subsequent septic condition. In the others I believe appendicitis was present; in a large proportion of cases I find patients complain of the pain as seated somewhere in the upper quadrant of the abdomen. Also, my personal experience in many attacks of recurrent appendicitis has invariably been that the pain of appendicitis was situated at the umbilicus or between that point and the xiphoid cartilage.

Two cases of amoebic abcess of the liver.

So far as we could find out neither of the men had lived in the South. Both were longshoremen. In neither case was there obtained a satisfactory history suggestive of previous dysentery, though in both cases the patients were too sick to give a reliable history, and the account of their previous health was obtained from friends.

Case 1. Man, 47 years, entered the surgical service August 27. Previous history negative. Two weeks before entrance to the hosptial he had been overcome by the heat and since then had not been well. He had nausea, frequent vomiting; no appetite, diarrhoea. Some pain at the epigastrium.

Physical examination. Appearance typhoidal. In the upper middle quadrant of the abdomen was a mass giving a sensation of

deep fluctuation; this mass extended downwards to the umbilicus and upward in curved lines, filling up the space between the cartilage of the ribs.

August 29th; Man appeared more sick. Temperature about 100° and pulse 80.

An incision was made; the peritoneum was found to be thickened. A cyst was found and opened; a thick yellowish fluid was evacuated which contained no organisms.

Sept. 6th; blood appeared in the stools. I was asked to see him in consultation by the surgeon in charge, and am sorry to say I committed myself in writing to "Probable malignant disease."

Autopsy, by Dr. Councilman:. Amoebae coli found in the intestines and in the contents of a fresh liver abscess. Typical amboebic ulcerations in the large intestine with numerous sloughs. There were three abscess cavities in the liver. On the lower border of the left lobe of the liver was an abscess very close to the surface, which had sloughed away, making a large encapsulated cavity formed by the stomach, spleen and left abdominal wall. The liver weighed 1450 gm. The intestines were generally lightly agglutinated; there were several openings from the transverse colon into the abscess cavity mentioned above. Spleen weighed 135 grammes.

Dr. Councilman in a note adds that it was evidently a very old case of dysentery.

Case 2. (Published before in Boston Medical and Surgical Journal, vol. cxxxviii, p. 155).

The history of this case is very incomplete, and I report it only because of the interest attaching to the rare disease found, namely, amoebic abscess of the liver.

On July 28th an old man was brought to the hospital in a state of marked collapse. He had walked into the Boston Dispensary, and was at once sent to the hospital by ambulance. He was pale, covered with a cold sweat; pulse small, intermittent and irregular. There was abdominal pain, and a history of obstinate constipation for eight days and no movement for five days. It was considered indiscreet to operate at once, and he was placed in bed and stimulants given.

I saw him in consultation with Dr. Munro the next day. In the right hypochondrium was a large, tense, hard mass, extending about four inches below the edge of the ribs. The liver dulness began in the fourth interspace. Over the right front a friction sound was heard. The diagnosis appeared to be between an enlarged liver and subphrenic abscess with depression of the liver.

There was during life no history of a preceding dysentery. His

wife said he had had good health up to the last four years, though he had been subject to attacks of obstipation.

Autopsy. Fairly well nourished. Abdomen distended. Old adhesions between the omentum and the anterior wall of the abdomen, above which is considerable thick pus, especially over the surface of the liver, the border of which is very low. Transverse colon and omentum adherent to the inferior surface of the liver, on the anterior surface of which is a white area from which pus was escaping. In the peritoneal cavity about 300 cc. of thick pus.

Surrounding the opening of the appendix was an area three cm. in diameter covered by shreds and loose tags in the vicinity of which were several slight ulcerations.

In the liver were four abscess cavities, one 12x9.5 cm., one size of an orange, one which had ruptured and a fourth near the third of smaller size. These abscesses had haemorrhagic, worm-eaten looking walls and were filled with thick grayish pus. In the pus amoebae were found. Heart, 360 gr. Spleen small.

Anatomical diagnosis. Chronic and acute amboebic ulcerations of the coecum. Amoebic abscess of the liver. Acute peritonitis from perforation.

Great interest attached to this case in that clinically no history suggestive of dysentery was obtained, and that pathologically the intestinal process was limited to a small area of the coecum.

Three cases in which the etiology was obscure.

Case 1. Man, 50 years of age, entered the medical service June 28.

Previous history. Fourteen years ago had a little pain at the epigastrium. Since then no gastric trouble. Marked alcoholic excess.

For two weeks before entrance to the hospital he had had a dull pain in the epigastrium, not affected by food. No nausea or vomiting. Bowels regular. Liver dullness began at the sixth rib and extended to three inches below the ribs. Midway between the umbilicus and the sternum was a tender spot. July 3rd; there was a bulging of the abdominal wall. Temperature, 99° to 100°. Pulse about 80. Liver was aspirated and a thick gray material was withdrawn. The pathologist reported, "The material consists of granular detritus with some fat, compound granule cells, etc. There is nothing to indicate its source. It may come from an obsolete cyst. Tumor can be excluded probably." (Signed Councilman.) He was transferred to the surgical service.

The liver then extended from the sixth rib to the level of the umbilicus.

July 6th; the liver was opened by incision and about one pint of granular detritus was evacuated. This material contained "no organisms and was made up of broken down pus." (Mallory.)

July 8th; patient comfortable. Gradual failure and death, July 18th.

Two cases of abscess of the liver in which the process was entirely secondary, being dependant upon the extension of a process forming in adjacent organs.

Case 1. Autopsy showed abscess of the liver, empyema of the right chest, gangrene of the right lung and purulent peritonitis. The whole right side of the chest was practically transformed into a gangrenous abscess cavity which communicated with the abscess of the liver, the latter in turn having given rise to the purulent peritonitis.

Case 2 Man, 33. Entered October 27th. History of severe paroxysmal pain in the stomach with haematemesis. During two months he had paroxisms of pain suggestive of gall stones. There was a tumor in the region of the liver.

Autopsy. Ulcer of the duodenum which was connected with an abcess of the liver by perforation. Acute diffuse fibro-purulent peritonitis.

Leaving out of consideration the two cases of abscess of the liver secondary to suppurative processes in adjacent organs, we have fifteen cases. An analysis of the chief symptoms in these cases gives the following data as to the most important and constant phenomena observed.

Chills were seen in seven cases: in each instance the chills were of frequent occurence. They appeared at irregular intervals in the day and at irregular periods, differing therein from the chills of malarial fever. In several cases two or more chills came in one day; they were usually severe, and often accompanied by vomiting, though as a rule the pulse was not as high as is seen in malaria with chills of corresponding severity.

Fever was present in fourteen of the cases, and in general was of a high grade; another and a marked characteristic was the extreme daily and at times hourly variation in the temperature, even independently of rigors. In the cases under my own observation a marked factor was the absence of mental stupor or even hebetude, as is seen in typhoid fever. Further, delirium was rare, mild in character, and usually seen only late in the course of the disease.

Autopsy. Anterior lobe of the liver a mere shell. Pericardium partially filled with purulent material and the surface shaggy.

Heart 370 grammes. Valves and cavities normal. Lungs not normal. Spleen large, soft, 370 grammes. Stomach and intestines not abnormal. Appendix small and free. In this case neither clinically nor pathologically was anything found suggestive of the cause of the abscess of the liver.

Case 2. Man. Entered medical service on November 2d. No history obtained, as the man was an Italian.

Physical examination negative, except a slight tenderness in both iliac fossae and in the right hypogastrium.

November 5th; headache, stupor and diarrhoea. November 11th; a little fever. November 18th; Some abdominal pain. December 3d; liver felt two inches below the ribs and somewhat tender.

Aspiration by needle negative. December 10th; leucocytes, 20,000. December 14th; one pint of pus obtained by aspiration in the sixth space anterior axillary line. December 19th; transferred to surgical service.

The liver was incised, freely drained, and on February 25th the man was discharged, practically well.

Case 3. Man, 51. Entered the medical service April 11th. Had been a hard drinker for many years. For two years general oedema. Heart enlarged to left and to right. Effusion in the right side of chest. Liver felt two inches below the ribs. Was discharged relieved in one week, and the diagnosis made was aortic and mitral disease. Ten days later he again came to the hospital. He had the previous night a chill. Some fever. April 23d; jaundice. April 26th; aspiration of the liver showed pus. Jaundice increased in degree. May 5th; after a gradual failure, death. In this case it is certainly possible that the abscess was secondary to an ulcerative endocarditis implanted upon an old valvular process, this being one of the recognized sources of abscess of the liver.

Pulse. In the cases under my care, and in most of those of which I have seen a complete chart, a marked characteristic has been a slow pulse. In two very sick men, in whose cases I was able to follow the entire course of the disease, the pulse averaged from 90° to 100°; in eight of the fifteen cases the pulse was noted as slow, and in only three was the pulse especially mentioned as being rapid. The slowness of the pulse was not dependent upon jaundice, as in the only case where there was deep jaundice the pulse was especially noted in the record as being rapid. This fact I believe to be of importance, especially as its existence led several men in one of my cases to consider the prognosis more favorable than the other symptoms warranted, and perhaps induced us to delay operation in a case where the only hope lay in an early surgical interference.

Enlargement of the liver was present in every case. The liver was easily felt in each case well below the edge of the ribs, and in several instances it extended fully to the umbilicus; further, the rapid enlargement of the liver, while the case was under careful daily consideration, was remarkable.

Spleen. In eight cases it was found to be enlarged; in three it was found by autopsy to be small, two of these cases being cases of amoebic abscess of the liver.

Vomiting was a most constant symptom, being noted as absent in only two instances.

Pain and tenderness are two symptoms of great importance in the diagnosis of abscess of the liver, important, because of their rarity and of their comparative insignificance when present at all. In ten of the cases there was no pain at all, and in five it was a symptom to which the patient was not inclined to pay much attention; further, in half of the cases there was no tenderness, or very slight tenderness on pressure. And in none of the cases, except one of a very large amoebic abscess, was the tenderness a symptom of importance.

From a study of the literature of this disease, I am not able to find satisfactory data as to the prominence of pain and tenderness, but if they form as small a part in the course of abscess of the liver in general, as they did in a few cases at my disposal, it is of great importance to recognize the facts I have stated.

Leucocytosis was present in five of the fifteen cases studied, being found in the only instances in which an analysis of the blood was made.

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|---|---|---|
| Case 1 | | 34,000 |
| | | 17,000 |
| Case 2 | July 24, | 7,800 |
| | " 27, | 8,000 |
| | " 30, | 16,800 |
| | " 31, | 23,000 |
| | Aug. 1, | 33,000 |
| Case 4 | | 12,000 |
| Case 10 | | 9,000 |
| | | 20,000 |
| Case 2 of Unknown Etiology | | 20,000 |

Unfortunately, there is in leucocytosis an important source of error in that cirrhosis of the liver of the hypertrophic variety a leucocytosis of moderate degree is found. Hypertrophic cirrhosis of the liver may be difficult to differentiate from abscess of the liver

if seen late in the course of the disease in a case where a satisfactory history is not obtained. Further, in abscess of the liver, where there is marked septicaemia, leucocytosis may be absent, as in other varieties of severe septicaemia, as is seen not infrequently in the advanced stages of acute septic peritonitis.

Jaundice was present in six cases; in one case it was marked; in others slight and appearing rather late in the disease.

Aspiration of the liver is by no means a satisfactory method of diagnosis, as the cavity may not be reached, as in several instances quoted; in one of my cases three ineffectual attempts were made to find pus.

Early and free incision is the only rational treatment; two of the fifteen cases recovered under this treatment.

From a review of these cases the most important signs of abcess of the liver, mentioned in proportion to their frequency, are tumor, fever, chills, leucocytosis, and a relatively slow pulse. The symptoms of less importance are pain, tenderness, vomiting, jaundice and enlarged spleen.

Lastly, symptoms or signs suggestive of appendicitis should arouse suspicion that abscess of the liver was present when the liver was enlarged and there was a condition of general septicaemia.